closely punctured; thoracic dorsum almost nude, the white hairs few and scattered, except at the scutello-mesothoracic suture, where they are dense enough to form a band, and on anterior part of mesothorax, where they form two obscure sublateral longitudinal bands; tegulæ testaceous; wings hyaline, nervures dark brown, second submarginal cell receiving first recurrent nervure almost at its extreme base, and second near its end; legs black, with white pubescence, pale orange on inner side of tarsi; spurs whitish; all the legs slender and simple; anterior coxæ with the usual stout spines; abdomen short and broad, rather shiny, strongly and closely punctured, hardly at all pubescent, except that the hind margins of the first four segments have dense white hair-bands, the last being continued on to the base of the fifth; sixth segment densely white-pubescent at base, at apex narrowed, produced and emarginate, the outline being like that of the two humps of a camel, but viewed from the side the outline is that of a rose-thorn, the end being curved downwards; beneath, the apex presents an obtuse median prominence and a short tooth on each side, laterad of which is an angle representing an incipient tooth; venter very sparsely pubescent.

Hab. Las Cruces, New Mexico, Aug. 23, 1897, at flowers of *Chrysopsis villosa* in the *Larrea*-zone (*C. H. T. Townsend*). Another, also from Las Cruces, is only 9 millim. long, but evidently conspecific.

M. Townsendiana by the shape of the apex of the abdomen recalls *M. deflexa*, Cress., from Kansas, but in the latter the tip is not emarginate and the mesothorax and vertex show black hairs.

XXI.—*A North-American Freshwater Jellyfish.*

By Edward Potts *.

On June 10, 1880, the first-known freshwater jellyfish (*Limnocodium Sowerbii*, Allman and Lankester) was discovered in the Victoria Regia tanks in Regent's Park, London. Near the end of November 1884 a primitive "hydriform organism," from which it was supposed the jellyfish might have been derived, was found in the same tanks and described by Alfred Gibbs Bourne †.

* From 'The American Naturalist,' December 1897, pp. 1032–1035; communicated by the Author.

† 'Proceedings of the Royal Society,' Dec. 11, 1884, vol. xxxviii. p. 9 &c. See also paper by F. A. Parson, Journ. of Queckett Club, 2nd series, vol. ii. 1885-86.

About two months after Mr. Bourne's discovery I first detected *Microhydra Ryderi* upon some stones collected the previous autumn from the rocky bed of Tacony Creek, a rapidly flowing mill-stream near Philadelphia, Pennsylvania, a small affluent of the River Delaware, but far above tide-level. Some peculiarities in its structure and mode of gemmiparous multiplication were described by my valued friend the late Dr. John A. Ryder *.

Dr. Ryder had not, at the time of writing the above paper, seen the living organism which he there described. Specimens were, however, some years later placed in his hands for study and watched for many months with exceeding interest. His early death has left in the possession of his representatives many excellent drawings and some valuable micro-slides as the only evidences of his interest and labour. No descriptive text has been found; and the sorrow that his many friends feel at his early removal has, to me, this added regret—that he was not able to complete an investigation, which, not unnaturally perhaps, I felt to be of so great importance, and that he cannot now share with us our great delight in witnessing the further development from *Microhydra Ryderi* of a "medusiform adult stage."

As may be seen by a comparison of the papers above named, all of them preliminary and incomplete, there are obvious points of resemblance as well as of difference between these minute organisms that appeared, almost simultaneously, at geographical points so widely distant. The supposition that the form observed by Mr. Bourne is the earlier condition of *Limnocodium* is, of course, greatly strengthened by my actual observation of the budding and separation of free-swimming Medusæ from *M. Ryderi* †.

We read that the specimens of *Limnocodium* often, perhaps generally, disappeared from the tanks about the end of June or July ‡. It is greatly to be regretted that the glass jars containing my species were not carefully examined throughout June and July of the present year, during which period there may have been a larger production of maturing jelly-fish. On the first day of August, however, my attention was arrested by the spasmodic contraction of an evident Medusa in the above-mentioned jar, and, during several following days, Prof. E. P. Cheyney and myself, on frequent occasions, watched the swelling buds upon colonies of *Microhydra* that

* 'American Naturalist,' Extr., Dec. 1886, p. 1232 &c.

† This alternation and progression may have been seen, later, in England, but I shall have to plead ignorance of the fact.

‡ In one case "swarms" are reported Aug. 18, 1882, at Kew Gardens.

had attached themselves to the glass. We witnessed the spreading of the disk, disclosing, from the first, eight marginal tentacles, a well-defined velum whose aperture was from one third to one fourth the diameter of the disk, and a manubrium depending, about one half the height (or depth) of the bell. Violent pulsating spasms finally resulted in an entire separation from the hydroid and the free life of a roving medusa. I kept no record of numbers, but it is believed that from twelve to twenty were seen.

Measurements were difficult, but, as nearly as I could make it out, the jellyfish was at this time about $\frac{1}{32}$ of an inch in diameter. It was of a somewhat prolate dome-shape, and when seen from the polar aspect the manubrium had a clearly quadrate appearance, from whose corners or lobes four radial canals curved downward to the marginal canal. At every point of junction occurred a single tentacle, and another of equal size was found midway between them. These eight tentacles (the only number as yet observed), always pendent, were plentifully charged with thread-cells, and, while susceptible of much variation in length, were not seen much longer than one half the diameter of the disk.

As to temperature, it is obvious that the water of the jars in which this Medusa was developed must have had nearly that of the surrounding atmosphere, with its diurnal changes —say from 60° to 85° at this season; during the winter, in our heated rooms, the temperature is probably more uniform. The hydroid form, in Tacony Creek, being but a few inches below the surface, must be subjected frequently to a temperature at or below the freezing-point.

It is quite improbable that under the present artificial conditions any Medusæ will attain full maturity this season. It is therefore manifestly unsafe to compare their minute size and general appearance with the totally dissimilar drawings given us of *Limnocodium*, where the latter had attained a diameter of about $\frac{1}{2}$ an inch. The full life-history of the organism must therefore be again left imperfectly recorded; but I am happy to be able to state that my friend Dr. Charles B. Davenport, of Harvard University, has consented to undertake the further technical study of it from material we have recently collected, and the drawings &c. left by Dr. Ryder, and to hope that many points now obscure may, through his efforts, be solved.

To aid the search of others for this—probably the most primitive Cœlenterate—it may be well to state that in my experience I have only found *M. Ryderi* in a natural condition, living as a messmate among colonies of Bryozoa that

may be considered almost perennial in habit, where its own disabilities as a food-collector, on account of local inertia and the total absence of tentacles, were supplemented by the life-sustaining currents induced by its more active neighbours. These conditions are near Philadelphia furnished by *Urnatella gracilis*, Leidy, and *Pottsiella erecta*, Kræpelin (*Paludicella erecta*, Potts). I regret to be obliged to add that I am not aware that either of these has been collected in any other neighbourhood.

Philadelphia,
August 19th, 1897.

XXII.—*A Revision of the Butterflies of the Genus* Ixias.

By Arthur G. Butler, Ph.D., F.L.S., F.Z.S., &c.

The present genus is confined to the Old World, being found throughout India and Ceylon, Burmah, Siam, China, and south-eastwards to the Celebes and Timor.

Ixias in general aspect resembles certain groups of the genus *Teracolus*, but is readily distinguishable by the neuration, the first two branches of the subcostal vein in the primaries being emitted wider apart, the upper radial emitted from the subcostal vein well beyond the end of the cell (expressed in the recently adopted phraseology this would stand as "veins 6, 7, and 8 stalked"). In the secondaries the discocellulars are much more oblique than in *Teracolus*.

The seasonal variation of *Ixias* differs somewhat from that of *Teracolus*, nor is it quite consistent in its character throughout the genus. As a rule the wet form has heavy borders to the wings on the upper surface and scarcely any markings on the under surface (often only a black dot at the end of the discoidal cells and a spot at the external angle of the primaries), but in some of the species there appears to be no wet phase of marking and coloration, and in others the wet-season form shows dark spots on the under surface occupying the exact positions of the ocelloid markings characteristic of the dry season.

Group 1. (Type *I. venilia*.)

Apical two thirds of primaries above veined with black; under surface always showing dry-season markings; the only probable seasonal difference consisting in the width of the border of the secondaries on the upper surface; it is not,